CROP PRODUCTION NEWS

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CROPS

Editor's Comments

By Faye Dokken-Bouchard, PAg, Crops Branch

Given what a "small world" Saskatchewan is, you probably all know at least one person that has been affected by the flooding this spring. Farmers in flooded areas have either been unable to complete seeding or have vulnerable crops that are emerging into environmentally stressful conditions. Crop Production News will continue to provide information to help agronomists and farmers deal with crop production issues, including those arising from excess moisture.

For updates on the flooding in Saskatchewan, visit www.saskflood.ca. For additional agricultural resources and information visit www.agriculture.gov.sk.ca and click on "Dealing with Excess Moisture". For a summary of Saskatchewan crop conditions and precipitation during the growing season, visit www.agriculture.gov.sk.ca/crop-report. Crop specialists are also available to answer production questions through the Agriculture Knowledge Centre at 1-866-457-2377 or aginfo@gov.sk.ca, or through any of our Regional Offices at www.agriculture.gov.sk.ca/RegionalOffices.

NOTE: Throughout this document, you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this on your computer screen, click your cursor on the link to take you directly to the website. ✿

Crop Production News is a bi-weekly publication prepared primarily by provincial specialists with the Crops Branch and Regional Services Branch of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

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Saskatchewan Ministry of Agriculture

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Crop Protection Laboratory Update

By Philip Northover, AAg, Supervisor, Crop Protection Laboratory

Near the end of June, sample submissions arrived into the laboratory with increasing frequency. With disruptions to regular mail service, results have been sent by fax or e-mail. This system has been working well. If you prefer to have your results sent out electronically, please include an email address on the submission form.

Disease related submissions have increased markedly since the last report. As indicated previously, the unusual weather in the last couple of years has encouraged the growth of plants and weeds that have challenged the knowledge of producers (and lab personnel)!

In the past week, the lab has identified the following plants: evening primrose (*Oenethera* spp.), downy brome grass (*Bromus tectorum*), dog mustard *(Erucastrum gallicum)* goldenrod (*Solidago* spp.), and willow herb (*Epilobium* spp.). Last year willow herb samples were sent to the lab a number of times. Many of them had set seed. We expect to see many more of this particular plant in 2011.

Cutworms from canola have been the only insect submissions in the past week. The specific type is still to be determined.

Submissions to date have been associated with the influence of environmental factors, diagnoses greatly assisted with excellent descriptions of the field situation. Yellowing cereal plants have been associated with excess moisture. Cereal leaves with damage to leaves, followed by new healthy growth with no damage have been associated with cold damage due to low soil/air temperatures. Sterility of flowers and discoloured heads have been attributed to freezing damage (see Fig. 1).

Figure 1: Fall Rye sample with damage attributed to freezing. Note the purple/brown discolouration. Florets at the top of the panicle are sterile or missing.
Source: Saskatchewan Agriculture

Below is the latest in disease submissions:
Canola: Group Two and Group 10 herbicide injury; wirestem (most likely *Rhizoctonia solani*); phoma leaf spot/blackleg (*Phoma lingam*).
Colorado Blue Spruce: Salt damage/drought stress;
Durum: Group One herbicide injury/cool conditions
Fall Rye: Freezing damage
Green Ash: Anthracnose (*Gleosporium aridum*)
Peas: Group 2 and/or Group 9 herbicide damage
Winter Wheat: Speckled snow mould (*Typhula ishikariensis*);
Wheat: Common root rot (*Bipolaris sorokiniana*); cold damage; water logging/excessive moisture ✿

Agriculture Knowledge Centre Update

By Brent Flaten, PAg, Integrated Pest Management Specialist

Inquiries during the past week have covered a wide variety of topics. As producers finish or just stop trying to seed, topics have been switching to in-crop weed control, fallow/unseeded weed control, insect pests and fungicides.

Many producers are inquiring about in-crop weed control. Sometimes these inquiries involve clarification of generic herbicide brands or new products. Other general inquiries have been made regarding what herbicide and tank-mix options are available for various weeds. The *2011 Guide to Crop Protection* is a good resource along with the spring update, which is available on our website at:
www.agriculture.gov.sk.ca/Guide_to_Crop_Protection

Acres that have been too wet to seed can create problems by producing very large weeds. Although these weeds are useful in sucking up some of the excess moisture, they can produce a lot of unwanted seeds if left to grow to maturity. Most large annual weeds can be controlled with high rates of glyphosate; however, some of the perennial broadleaf weeds may be difficult to control even at these high rates. For more information on specific weeds, contact your local regional crop specialist or the Agriculture Knowledge Centre at 1-866-457-2377.

Producers and private agronomists have been sending in pictures of various weeds for identification. In some cases, if the pictures are clear and include both wide-angle and close-up shots, we can identify them. However, the most precise way to have unknown weeds identified is to send them to the Crop Protection Lab at 346 McDonald Street, Regina, SK, S4N 6P6. There is a nominal fee of $10 for this service. You can download or fill out and email a form directly from our website at:
www.agriculture.gov.sk.ca/Crop_Protection_Lab

One of the weeds we have received a few inquiries on is sticky willowherb. This weed is a perennial native herb that likes wet areas. It is not considered to be very competitive with crops. No herbicide research has been done on it.

Figure 2: Sticky willowherb. Source: Saskatchewan Agriculture.

Insect inquiries have included flea beetle economic thresholds and insecticide choices for late-seeded canola. Most of the canola has out-grown the risk of flea beetle activity. Cutworms and wireworms continue to damage crops. Cutworms will be pupating in the next few weeks, so flagging damaged areas and monitoring them for continued damage is warranted before investing in an insecticide application. With the cooler weather, pupation may be delayed more than normal. Wireworm control is only available with Cruiser Maxx and Raxil WW seed treatments. Also see "Insect Update" in this edition of CPN.

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Agriculture Knowledge Centre Update
(Continued from page 3)

With the wet weather and the high disease inoculum levels from last year's crop residue, producers are inquiring about fungicide application timing, assessing potential for economic return from fungicide application and what products to use. There have been some reports of botrytis and ascochyta/anthracnose in lentils and cereal leaf diseases. More information is available on our website by selecting Crops, then Crop Protection, then Diseases. Also see "Time to Start Scouting for Plant Diseases" in this CPN.

Thanks to the recent heavy rains, there have also been inquiries about purpling or yellowing crops including canola, cereals and lentils. These crops are in saturated soil and are suffering from water stress. There is no quick cure for this, other than warm dry weather.

A few producers are still trying to seed some crops; however, there is a high risk that fall frost will hit anything seeded now. It is still possible to seed crops for green-feed or plough-down. See "Managing Moisture with Green Manure Crops" in this CPN.

Soils-related questions are revolving around top-dressing. Top dressing nitrogen can contribute to extra yield if done by the fifth leaf stage of cereals or by the early rosette stage of canola. Top-dressing sulphur on canola up to the bolting stage can contribute to yield if the soil is sulphur-deficient.

Forage inquiries include termination of perennial forages using glyphosate prior to harvest, appropriate dates to seed perennial forages, pricing of the 2011 forage crop, and forage harvesting methods e.g. silage, silage bales and baling. ☼

Agriculture Knowledge Centre

Hours: 8 a.m. to 5 p.m. Monday to Friday
Phone: 1-866-457-2377

Got a question?
E-mail: aginfo@gov.sk.ca
Want to submit your question online?
Go to our http://www.agriculture.gov.sk.ca/ask_saskatchewan_agriculture form page.

Forecasting Late Blight in 2011

By Connie Achtymichuk, PAg, Provincial Specialist, Vegetable Crops

Forecasting Late Blight in 2011

Given the incidence of late blight in recent years and the moist conditions in some areas of the province, the risk of late blight infections in potatoes, tomatoes, peppers and eggplant exists again this season. Late blight (*Phytophthora infestans*) overwinters on diseased potato tubers. If these tubers are used as seed, late blight will likely be present on the emerging plants. In order for the spores to multiply, weather conditions must also be suitable. Temperatures between 15 and 20˚C with a relative humidity around 90 per cent provide ideal conditions for the spread of late blight. Spores produced infect adjacent plants and nearby fields. Under ideal conditions, fields can be destroyed within days. Fruit forming on infected tomato, pepper and eggplant will exhibit rapidly growing, dry, reddish brown lesions, often on the shoulder of tomatoes. Infected fruit will rot on the plants or during storage. Potato tubers are infected by spores that wash from blight-infected leaves into the soil. Infected tubers may appear normal from the outside but when cut, the flesh near the outside of the tuber shows a characteristic reddish brown rot.

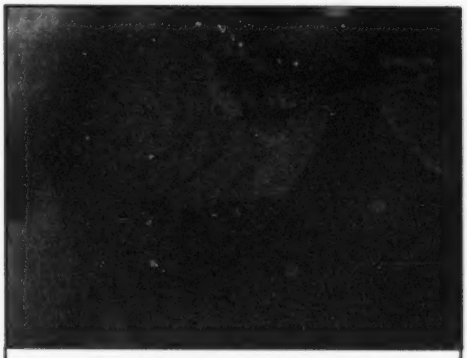

Figure 3: Late Blight on potato leaves. Source: Dr. Doug Waterer, University of Saskatchewan.

Monitoring

Scouting is important to late blight management. Catching an outbreak in its earliest stages can reduce losses and increase options for control. Frequently examine the leaves and stems throughout the canopy. The first sign of blight on leaves is a water-soaked lesion, often surrounded by a pale yellow halo of newly infected tissue. Lesions run across the veins, as opposed to early blight, where the lesions are typically confined by the leaf veins. In dry weather, late blight lesions stop growing and turn dark brown and brittle. Early in the morning or on wet days, a white cottony growth may be detected on the undersides of infected leaves. Infected stems and petioles will turn dark brown or black. As the infected stems weaken they droop, giving a characteristic flagging look to the canopy.

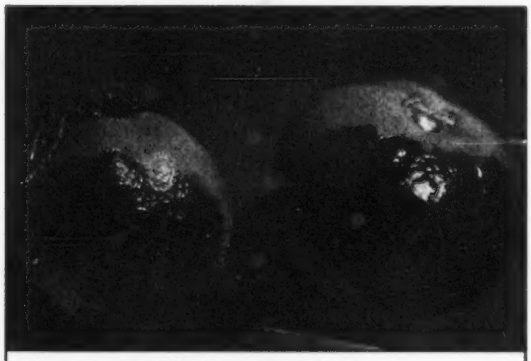

Figure 4: Late Blight on tomato fruit. Source: Dr. Doug Waterer, University of Saskatchewan.

Suspect plants should be immediately pulled out, bagged, removed from the garden and destroyed. The plants in the vicinity of the infected plant are also likely infected and therefore should also be removed or closely monitored for signs of disease development.

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Forecasting Late Blight in 2011
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Potato tubers and tomato fruit going into storage should be carefully inspected. Remove and destroy any suspect items. Monitor the stored crop carefully, especially for the first few weeks after harvest, as late blight has the potential to spread within storages.

Cultural Control
Clean seed is the first line of defence against late blight. As much as possible, avoid planting seed potatoes that may potentially be carrying blight, as this is how blight carries over from season to season. Purchase seed potatoes from reputable suppliers. Inspect the seed prior to purchase or planting and discard any suspect tubers. Culled potatoes should be bagged, buried, composted, or otherwise disposed of – if they sprout and grow they will spread disease. **Late blight can be introduced on transplants.**

Cultivar resistance
While no potato varieties are fully resistant to late blight, russet varieties tend to be more blight resistant than red types. Some tomato cultivars claim to be tolerant of blight;
Note – these cultivars have not been tested for suitability in SK:
Grape tomatoes – cv. Santa and Juliet Standard tomatoes – cv. Defiant and Legend

Production practices
Irrigation water should be applied so the foliage dries before evening. Ideally the soil around the plants will be watered, rather than the foliage. Tomatoes should be pruned and staked to promote airflow through the canopy. Avoid over-fertilization to reduce excessive top growth, which can hinder air movement through the canopy.

Proper hilling of the potato crop will help protect the tubers from spread of late blight spores washing from infected leaves into the soil. Potato vines should be completely dead and ideally removed from the garden prior to harvest, otherwise spores can spread from vines to the tubers during the harvest operation. If possible, leave tubers in the ground for about two weeks after the vines have been destroyed. This allows blighted tubers to rot so they can be easily identified and culled out at harvest. Tubers set near the soil surface are the most likely to be infected, therefore it is prudent to discard any tubers that show any signs of greening. If more than five per cent of the harvested tubers have late blight it is unlikely that the crop can be successfully stored.

Protective Spraying
There are a number of fungicides registered for the control of late blight by commercial producers. Please consult the Guide to Crop Protection for a listing. Copper-based fungicides are registered for use by home gardeners. **Spraying must commence before the blight arrives, with new spray applications after rain events and/or as new foliage develops.** Complete coverage of both surfaces of the leaf and the stems is crucial when spraying for late blight. While copper-based sprays are generally considered to be safe to the applicator and the crop, there are concerns about their impact on beneficial soil organisms such as earthworms. Growers are encouraged to take an integrated approach to managing blight rather than relying strictly on spraying to control the problem.

Vigilance will be the key to managing late blight in 2011 – keep a close eye on your own crop and listen for reports of the disease occurring in your area. More information on late blight can be found at www.agriculture.gov.sk.ca/Crop-Protection. ✿

Managing Moisture with Green Manure Crops

By Chantal Jacobs, PAg, Provincial Specialist, Organic Crops

In an average year, particularly those in drier regions, growers manage legume green manure crops with the goal of minimizing soil moisture use while maximizing nitrogen (N) fixation. The current and previous crop seasons have been wetter than normal and growers may be adjusting their strategy to see how they can increase moisture use, N fixation, and manage weeds on saturated soils. If land was too wet to seed this spring, late seeded legume green manures may provide an opportunity to use excess moisture and fix N for next year's crop.

Annual green manure crops that are properly inoculated can fix a significant amount of N, and still provide the opportunity to work the crop in before weeds set seed. Although growers may be tempted to summerfallow land that was too wet to seed this spring, they could consider seeding an annual green manure (i.e. black lentils, field peas, etc.) which can significantly deplete soil moisture levels compared to summerfallow.

Typically, incorporation of annual green manures should occur between the late-bud and full-bloom stages in average to good moisture conditions, and earlier, at budding, if conditions (in some regions) are dry. Research in the Dark Brown soil zone showed that a lentil green manure crop returned 38 and 75 kg N per ha (34 and 67 lbs N per ac) to the soil at early (bud) and late (full bloom) incorporation, respectively (Brandt, 1990). Another study showed that annual N fixation rates for annual legumes harvested at maturity were 75, 105, and 160 kg N per ha (67, 94 and 143 lbs N per ac) for lentil, pea and fababean, respectively, in the Gray and Gray-Black soil zones (Bremer et al., 1988).

Deciding when to terminate green manures can be a difficult decision. On average, annual green manures are incorporated approximately eight to 10 weeks after seeding. Research in the Dark Brown soil zone showed that black lentil was capable of doubling its biomass production between the early bud and full bloom stage (Brandt, 1999), thus, in good soil moisture conditions, it would be recommended to terminate the stand at full bloom. Plant biomass is roughly three per cent N (based on per cent dry matter) and annual legumes, like peas and lentils, fix up to 80 per cent of their N requirements under optimum fixation conditions (adequate moisture, warm soil temperature, properly inoculated seed and N depleted soils). Because of this, more aboveground biomass will result in more atmospherically fixed N that is returned to the soil for the subsequent crop.

Leaving the green manure any longer will not provide a significant N benefit as the crop will shift into the reproductive phase of its life cycle and begin moving N into the seed. Terminating the stand later than full bloom may also provide weeds with an opportunity to set seed and increase the weed seed bank and competition with the crop in the following year.

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Managing Moisture with Green Manure Crops
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Biennial and perennial forages have consistently shown rotational yield benefits to subsequent crops, and yellow blossom sweet clover and alfalfa are commonly used to help manage weeds and increase soil N levels.

In typical conditions on the prairies, the high water use of these forages can dry out the soil. However, the unusually wet conditions that currently exist in many areas may provide the optimum opportunity to establish a forage variety, particularly in saline affected areas where dry conditions can reduce forage stand establishment.

Sweet clover, a biennial known for its ability to use significant soil moisture, competes with weeds and increases soil N. Growers that intend to seed an annual crop next year will want to consider late fall termination this year or early spring termination next year to avoid having to seed into heavy sweet clover residue. Sweet clover has allelopathic properties and competes well with weeds. Large seeded crops will be less impacted by allelopathic chemicals released as the clover residue breaks down. Ideally, sweet clover will provide the most nitrogen and soil drying benefits if left until the 10 per cent bloom stage in the following growing season. Terminating it at this stage will help manage weed populations, maximize N fixation and avoid excess soil drying.

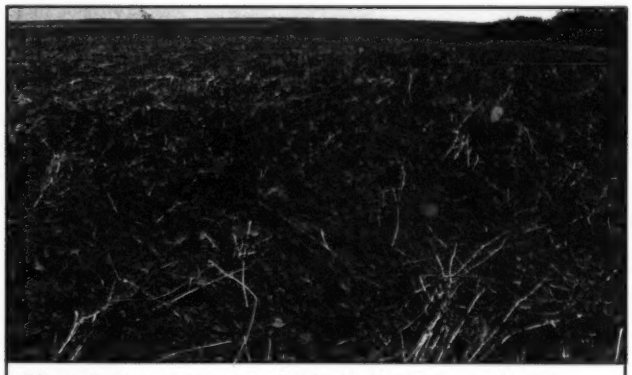

Figure 5: Sweet clover termination in the Brown soil zone. Source: Saskatchewan Agriculture.

Alfalfa provides many benefits to subsequent crops. Prairie research has shown that the majority of the N additions from alfalfa occur within the first three to four years of the stand. Alfalfa returns from 41 to 101 kg N per ha (36 to 91 lbs N per ac), including the roots which account for between 20 to 32 per cent of the N benefit. Keep in mind that plant biomass is roughly three per cent N (based on per cent dry matter) and N return to the soil from any legume residues will be highly dependent on growing conditions. After termination the N benefit from alfalfa to subsequent grain crops may be seen for two to three years. Nitrogen mineralization rate from the alfalfa residues will be highly dependent on soil moisture and environmental conditions.

Too wet to seed this spring? Evaluate your options and use this opportunity to provide organic matter and nutrients back into your soil. Consider seeding a winter cereal this fall and underseeding a forage (i.e. red clover) into the winter cereal stand next spring to provide an added N benefit and use up additional soil moisture. Change up your rotations and keep those weeds guessing.

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Managing Moisture with Green Manure Crops
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For more information on assessing stored soil moisture, forage rotations and calculating the fertilizer replacement value of legume green manure crops, check the Saskatchewan Agriculture, Natural Systems Agriculture and Saskatchewan Forage Council websites at:

Measuring stubble subsoil moisture to determine stored water:
www.agriculture.gov.sk.ca/Soils_Fertility_Nutrients

Forage Crop Production Guide:
www.agriculture.gov.sk.ca/Forage-Crop-Production-Guide

Fertilizer Replacement Value of Legume Green Manure Crops:
http://umanitoba.ca/outreach/naturalagriculture/articles/frv.html

Growing Forage Legumes in Rotation with Annual Crops:
http://saskforage.ca/publications/NitrogenFactsheet.pdf ✿

Using Growing Degree Days to Estimate Maturity

By Dale Risula, PAg, Provincial Specialist, Special Crops

Warm sunny days are a crucial part of the growing season in a year when seeding is delayed.

Saskatchewan Agriculture's *Varieties of Grain Crops* describes the relative maturity ratings between crops and varieties, indicating the number of days required from seeding to swathing readiness. This information is increasingly important when seeding is delayed. Crop maturity can further be influenced by local climatic conditions so it is also important to be aware of crop development throughout the growing season.

Many producers choose Growing Degree Days (GDD) as a tool to measure crop development. This helps account for the variations in climatic conditions. It is very useful because plant growth and development are based on heat accumulation. A simple description of the science is*: Growing degree days are calculated as the average daily temperature minus five to arrive at the daily GDD.*

As an example, a day with a maximum temperature of 20 C and minimum temperature of 10 C would have a GDD accumulation of (20 + 10)/2 – 5 = 10 GDD. Five degrees is subtracted as it is considered to be the minimum temperature for plant growth.

All crops have their own needs for heat accumulation or GDD to reach maturity.

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Using Growing Degree Days to Estimate Maturity
(Continued from page 9)

Table 1 presents research by Dr. Brian Fowler and Dr. Brian Duggan at the University of Saskatchewan, showing average GDD requirements for crop varieties commonly grown in Saskatchewan.

Table 1: Different crops GDD requirements.
Source: University of Saskatchewan

Crop	GDD requirement
Flax	1,200
HRS wheat	1,175
Argentine canola	1,040
Oats	961
Barley	850
Polish canola	850

Example: In an average year for canola seeded at Kindersley on May 1 and requiring 1,040 GDD, the expected maturity date based on GDD would be approximately August 25. If it were seeded on May 25, the expected maturity date would be September 19. Maturation is shortened by roughly seven days because of higher temperatures in mid-to-late-August compared to early May.

At the Agriculture and Agri-Food Canada Scott Research Station, Stu Brandt's research showed that canola crops require the most GDD during seed fill while cereal crops have their major requirement during vegetative growth (Table 2). Hot weather in early summer would be of most benefit to the cereals, and warm August days would help canola more.

Table 2. Summary of crop thermal requirement (GDD 5C base).
Source: Stu Brandt, AAFC Scott, 1993-1997, unpublished.

Crop	emergence to flowering	start to end of flowering	end of flowering to mature	Total GDD
B. napus	375	222	413	1,010 – 1,063
B. rapa	284	241	366	891 – 938
B. juncea	294	241	425	960 – 1,006
S. alba	280	254	438	972 – 1,011
Flax	429	165	410	1,004 – 1,050
Pea	545	165	292	911 – 960
Lentils	507	198	338	1,043 – 1,088
Wheat	525	135	346	1,006 – 1,046

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Using Growing Degree Days to Estimate Maturity
(Continued from page 10)

Although this is a good model for estimating maturity, other factors, such as temperature at flowering and day length, may have impact on flowering and yield could cause fluctuations in these times. There are various weather websites providing historical information allowing you to look at detailed weather data for your needs:

- The Winter Cereals Weathermanager (www.wintercereals.ca/weathermanager) is useful to estimate probability of maturity by a specific date for different crops and locations based on GDD and seeding dates.
- Farmzone(www.farmzone.com) provides growing degree days on a daily basis or an accumulation for a specified time period.
- The websites www.weatheroffice.gc.ca and http://weatherfarm.weatherbug.com provide good planning data also.

For more information on using these tools contact your nearest Regional Office or the Agriculture Knowledge Centre @ 1-866- 457-2377. ✿

Time to Start Scouting for Plant Disease

By Faye Dokken-Bouchard, PAg, Provincial Specialist, Plant Disease

As we learned last year, plant diseases do well in wet weather. Moisture will once again play a role in disease management for 2011, and early signs of disease have already been reported. When scouting for plant disease this summer, consider where diseases come from and at what stage crops will be most susceptible or at the greatest risk of yield loss.

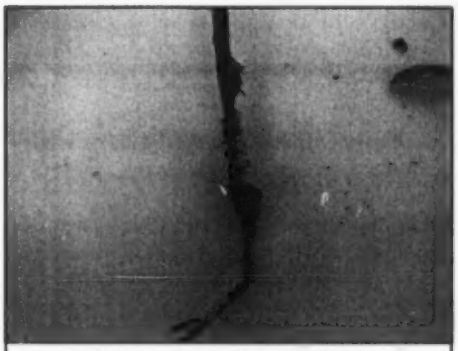

Figure 6: Botrytis seedling blight on lentil. Source: J. Deeks, Viterra

There is fungus among us

Fungal organisms are responsible for most of the plant diseases in western Canada. Fungi are everywhere – they may live as saprophytes (break down dead material) or pathogens (infect/feed on living hosts) or both (opportunistic). Fungal plant pathogens may be present in seed, soil, crop residue, or spread from plant to plant (near or far, depending on the disease). In order to cause disease, they need to survive long enough and travel far enough to find a suitable host at a susceptible stage under the right conditions. Easy, right?

Some pathogens survive on seed, such as *Botrytis* on lentil. Due to mouldy lentil crop issues last season, seed testing labs saw an increase of this pathogen on lentil seed. Botrytis seedling blight can spread quickly down the seed row in moist conditions, causing more seedlings with disease than there were infected seeds (see Fig. 5). Seedling blight was reported on lentil crops in the Laird area the week of June 20.

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Time to Start Scouting for Plant Disease
(Continued from page 11)

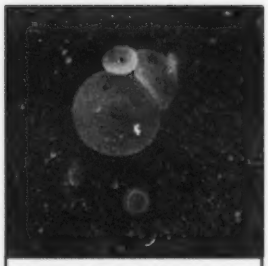

Figure 7: Apothecia
Source: Saskatchewan Agriculture

Sclerotinia stem rot of canola survives the winter by producing soil-borne resting structures called sclerotia. Under moist conditions, sclerotia germinate to form apothecia (see Fig. 6), which produce millions of spores. Many of the spores will die, but some will end up infecting nearby canola during flowering, and a few may even become airborne and spread farther. Sclerotinia can also infect other broadleaf crops such as lentil.

Each of the ascochyta blight diseases (different species for each pulse crop), anthracnose on lentil, and various leaf spotting diseases on cereals, overwinter on their respective crop residue. Spores transfer a short distance from the residue onto the crop and then spread from plant to plant. Due to the moist conditions this spring, we should be watching out for early signs of ascochyta blight on pulses, anthracnose on lentils, and cereal leaf spotting disease such as tan spot.

Figure 8: Stripe rust of winter wheat.
Source: C. Pearson, Viterra

Most cereal rusts cannot survive Saskatchewan winters. Therefore, rust spores must travel north from infected plants in the southern USA and Mexico through wind currents. Stripe rust of wheat and crown rust of oats may also survive mild winters on a living host (e.g. winter wheat infected with stripe rust, see Fig. 7) or alternate host (e.g. buckthorn infected with crown rust, see Fig. 8) in Saskatchewan. According to backward wind trajectory analysis by Agriculture and Agri-Food Canada from June 8 to 15, there is currently a low to moderate risk of stripe rust from the Pacific Northwest USA, and a low to limited risk of other cereal rusts from the south and central Midwest regions of the USA. Stripe rust was observed in the Yorkton, Imperial, Regina, and Avonlea areas the week of June 20. Crown rust was observed on buckthorn in Regina the week of June 20.

Why wet weather leads to disease

Fungi thrive in warm, humid environments. Furthermore, rain physically disperses the spores of some pathogens. Ascochyta blight and anthracnose in pulses, blackleg in canola, and septoria leaf blotch in cereals are spread through rain-splash. On the other hand, cereal rust and tan spot spores and sexual spores produced by *Ascochyta* and *Sclerotinia* are airborne. Wind can carry airborne spores farther than rain-splashed spores but rain may still be required to remove spores from the air(scrubbing action) and moisture often remains an important factor for spore germination and infection.

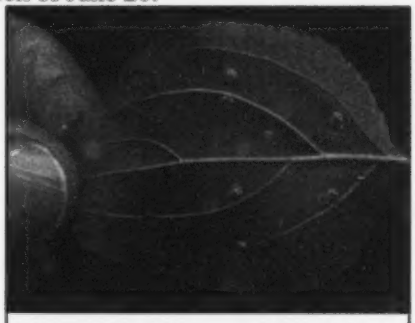

Figure 9: Buckthorn – an alternate host for crown rust of oats.
Source: Saskatchewan Agriculture

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Time to Start Scouting for Plant Disease

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Figure 10: Mycosphaerella blight of peas. Source: Saskatchewan Agriculture

Scouting and proper identification of disease is essential no matter what the weather conditions. Refer to the book Diseases of Field Crops in Canada, Saskatchewan Ministry of Agriculture fact sheets, and other field guides for symptom descriptions and photos.

To spray or not to spray

Consider other factors besides weather that may be contributing to disease risk, such as rotation, variety, and past occurrence of disease. Finally, consider whether the crop has the potential to pay for the fungicide application(s). See Table 3.

Table 3. Calculating Expected Net Return When Considering a Fungicide
Source: Saskatchewan Agriculture

Spray Warranted		Spray Not Warranted
If expected yield loss per acre ($) is higher than the cost of a fungicide application		If expected yield loss per acre ($) is lower than the cost of a fungicide application
If expected net return per acre is positive		If expected net return per acre is negative
Expected Gross Return ($/acre) =		
Estimated Yield (unit/acre)	X Estimated Yield Savings (%) X	Selling Price ($/unit)
Expected Net Return ($/acre) =		
Expected Gross Return ($/acre)	minus	Fungicide application costs

Given recent moist conditions, we can expect to see plant diseases again this year, but it is important to remember that current weather and early signs of disease do not necessarily translate to immediate need for control. Fungicide timing is important and so is the weather we receive once we reach the proper growth stage for control. See Table 4.

When applying multiple fungicide applications in one season, pay close attention to labelled recommendations for fungicide resistance management. Always follow proper rates, rotate fungicides in different resistance groups, tank-mix fungicides from different groups where registered, and do not exceed maximum number of applications per season.

Figure 11: Canola should be between 20-30% bloom if spraying for sclerotinia. Source: Saskatchewan Agriculture

(Continued on page 14)

Time to Start Scouting for Plant Disease
(Continued from page 13)

Table 4. Critical Stages for Control of Foliar Diseases Favoured by Moisture
Source: Saskatchewan Agriculture

Crop	Disease	Critical Stage for Fungicide Application
Cereals	Leaf Spotting Diseases (*Septoria* spp., *Stagonospora* spp., *Pyrenophora* spp., *Cochliobolus sativus*)	**Three to Five Leaf** – Leaf Spots May see benefit when cereal on cereal residue, AND symptoms are on newest leaf, AND moist dense canopy, AND crop prices good, AND if follow-up with flag leaf application.
	Rusts (*Puccinia* spp.)	**Flag Leaf Emergence** – Leaf Spots & Rusts Most important for cereal yield. If only one application, this should be it.
	Fusarium Head Blight (*Fusarium* spp.)	**Early Flowering** Protect the flowering heads. It is too late for control once symptoms are observed.
Chickpea	Ascochyta Blight (*Ascochyta rabiei*)	**Seven to Ten Node** Early application is critical. Consider spray intervals of five to seven days if disease risk is high and every two or more weeks if low.
Lentil	Anthracnose (*Colletotrichum truncatum*) Ascochyta Blight (*Ascochyta lentis*)	**Beginning of Flowering** Although symptoms may appear earlier this year, consider whether the plants are too small to spray. Best control will be achieved prior to canopy closure, with one or more additional sprays in 10 to 14 days if disease risk is high.
	White Mould & Grey Mould (*Sclerotinia sclerotiorum* & *Botrytis cinerea*)	**Before Canopy Closure** Applications are not always effective because coverage is difficult to achieve when moulds grow under the crop canopy.
	Stemphylium Blight (*Stemphylium botryosum*)	**No Fungicides Registered** Yield impact and control options are currently being researched in Saskatchewan.
Pea	Ascochyta Complex (*Mycosphaerella pinodes, Ascochyta pisi, Phoma* sp.)	**Beginning to Mid Flowering** Consider a fungicide application if symptoms are present and weather favours disease.
	Downy Mildew (*Peronospora viciae*)	**Beginning of Flowering or Onset of Symptoms** NEW! Headline is now registered to manage secondary foliar infections
Canola	Blackleg (*Leptosphaeria maculans*)	**Two to Six Leaf Stage** Most varieties have good resistance; however if blackleg has been a problem or physical damage has occurred, disease may appear.
	Sclerotinia (*Sclerotinia sclerotiorum*)	**20-30 Per Cent Bloom** Protect canola petals before they drop. It is too late once symptoms are observed.
Flax	Pasmo (*Septoria linicola*)	**Mid-Flower** Flax is most susceptible to pasmo during ripening; however, epidemics can occur earlier when favourable, moist conditions prevail.

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Insect Update

By Scott Hartley, PAg, Provincial Specialist, Insect and Vertebrate Pests

Cutworms

Cutworms have been the main insect issue in crops this spring. Feeding typically decreases in late June and into July as cutworms begin the pupation stage of their life-cycle. Temperature is a key factor in determining when the cutworms complete their larval stage. Cool conditions will slow development, extending the period of feeding. Cutworm species also vary. Those that started off the spring as an egg (e.g. redbacked and pale western) normally continue to feed longer than larvae that began the season as an overwintered young larva (e.g. dingy and army). Scouting fields remains important as the late, larger larval instars can be responsible for the most severe damage. Size provides a reasonable estimate of a mature larva. Once a larva reaches a length of about 35 mm (greater than 1.25 inches), it is nearing the end of the immature phase. Feeding damage will then cease and control efforts are no longer viable. Application of insecticide to reach the soil surface will also be compromised as the crop canopy fills in.

Keep in mind that there are also several insect species that are not damaging to crops and some are beneficial. Larvae of crane flies (Family Tipulidae), stiletto flies (Family Therevidae), and enchytraeids (small earthworm-like worms) have all been reported in various crops. None are economically damaging and do not require control.

Diamondback Moth

Diamondback moth monitoring using pheromone traps will continue until mid-July. Both Manitoba and Alberta reported higher numbers of moths in southern regions. However, although there is a similar trend up to mid-June there were few moths picked up in Saskatchewan traps. Low cumulative numbers (less than 20) have been reported near Regina, Avonlea, Rosetown and Swift Current. Heavy rain events can have a negative affect on diamondback moth larvae. They are knocked off the plant and often will drown, naturally reducing numbers. If heavy rain is forecast, this factor should be considered when scouting for this pest prior to any application of insecticide.

Grasshoppers

Grasshoppers are not expected to be a significant pest issue for Saskatchewan in 2011, especially in areas with excessively wet conditions. Below average temperatures have delayed hatching with the first pest grasshopper species starting to emerge in mid-June.

Wheat midge

Wheat midge infestations may be the next insect pest affecting wheat producers. The 2011 wheat midge forecast indicated high populations present in the soil throughout the dark brown and black soil zones. Good moisture will favour this pest but the cool conditions will delay emergence to some extent. Rather than late June it is likely that wheat midge will not begin emergence until into July for most areas in 2011. Emergence of the wheat midge adults from the soil is estimated using temperature (degree day accumulation). Visit http://weatherfarm.weatherbug.com/farm/login.aspx to estimate timing of wheat midge emergence in your area.✿

Emergency Use Registration of Liquid Strychnine Concentrate has Ended

By Rich Wilkins, Provincial Specialist, Pesticide Regulatory

The Emergency Use Registration of **two per cent Liquid Strychnine Concentrate** for the control of Richardson's ground squirrels ended on June 17, 2011.

Two per cent Liquid Strychnine Concentrate is no longer available for purchase at Rural Municipality offices or Agriculture Retailers and the application of two per cent Liquid Strychnine Concentrate must have been completed by June 17th.

Producers requiring information on other methods to control Richardson's ground squirrels are advised to check out the *Integrated Pest Management for Richardson's Ground Squirrels* and the *Control of Richardson's Ground Squirrels* factsheets on the Ministry website under Vertebrate Pests at www.agriculture.gov.sk.ca/Crop-Protection; or phone the Agriculture Knowledge Centre at 1-866-457-2377. ☼

For information about submitting samples to Saskatchewan Agriculture's Crop Protection Lab go to:
www.agriculture.gov.sk.ca/Crop_Protection_Lab;
or phone (306) 787-8130.

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